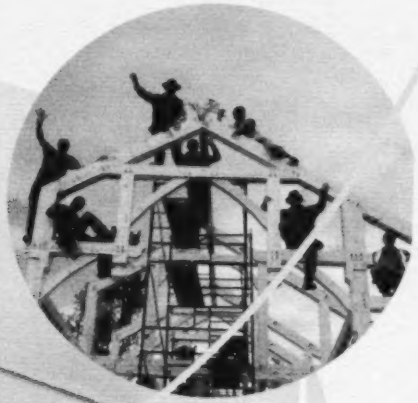
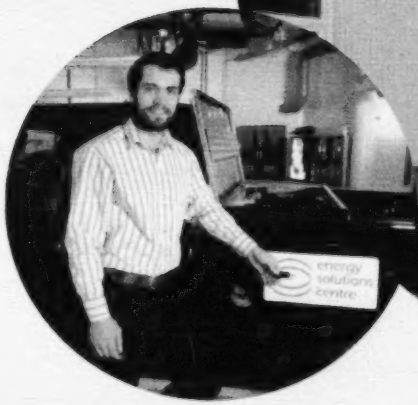
2015-2016

ENERGY BRANCH

ANNUAL REPORT





Yukon
Energy, Mines and Resources
Energy Branch

energy solutions centre

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Cover Page photos (left to right): Mitigating transportation emissions by converting a truck's gas engine into an electric one in Whitehorse at one of our renewable energy technology courses, using solar energy on the John Tizya Culctural Centre to offset diesel electricity generation in Old Crow, and improving residential heating efficiency through improved building science in Whitehorse.

MESSAGE FROM THE DIRECTOR

Director Shane Andre viewing the world through a "solar eye" - a photo that identifies objects that will shade solar photovoltaic panels and reduce their efficiency in generating electricity.

As the Yukon government's Energy branch, we take the role of serving the public seriously and with pride. Public service and and education accounts for the bulk of our activities and annual budget since we were established in 2001. We demonstrate this value in a number of ways.

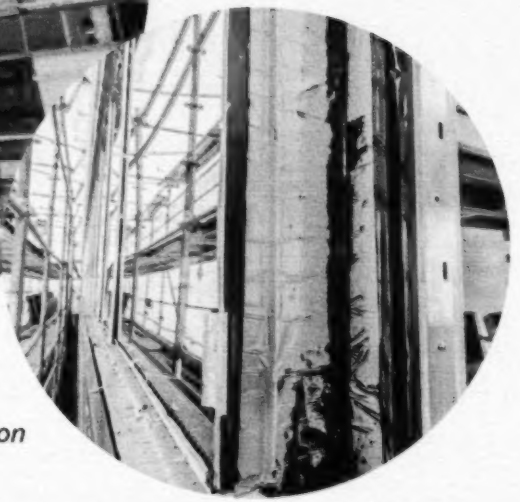
We are a service centre: Through the Energy Solutions Centre, we work directly with the public to navigate new alternatives to residential energy needs. This is a rapidly changing sector and our Good Energy Incentives Program is constantly changing to keep pace. In addition, through the Micro-generation Program and our evolving role in the EnerGuide rating system, we have taken on significant responsibility for directing housing efficiency and residential renewable energy options in Yukon.

We are a front line branch of Yukon government: Our role in developing Yukon energy policy has increased over the past few years. We now spend considerable time working with Yukon's utilities, Yukon First Nations, the federal government, and other branches of Yukon government to inform and resolve energy issues in the public interest.

We are the energy information hub for Yukon: We are the only energy authority in Yukon with a mandate to investigate all forms of energy and their contribution to climate change: heat, electricity, and transportation. Our generalized knowledge of energy, in combination with our collaborative work with other infrastructure and energy providers, has made us a one-stop shop for energy information. We work hard to make that information available to the public.

This annual report shares our accomplishments and successes with you. I am proud of our service provision and am certain that the hard work and dedication of Energy branch staff will continue to benefit Yukoners.

Shane Andre,
Director, Energy Branch
Energy, Mines and Resources
Government of Yukon



Energy Project Snapshot:
Government of Yukon Main Administration Building Renovation Upgrades

The existing fuel and power costs for the government's main administration building is approximately $900,000 per year to heat and emits about 1,233 tones of greenhouse gases annually. The energy upgrades to the building's insulation, air sealing, and EnergyStar® windows and are estimated to save $227,000 and 311 tonnes of greenhouse gas emissions annually.

Photos (left to right): New insulation added throughout building, original insulation uncovered after siding removed, and vapour barrier upgrades and window replacements.

ENERGY BRANCH MANDATE

The Energy branch is a part of Yukon government's Department of Energy, Mines and Resources. We are a front line branch providing a range of services to our clients, including Yukon residents, other government departments, First Nations, municipalities and businesses.

Our Mandate

Facilitate the coordinated, effective, and collaborative delivery of energy policy, projects, and programs, to promote a secure and sustainable Yukon energy sector.

Our Services

- Deliver programs through the Energy Solutions Centre to encourage energy efficiency through the use of energy efficient household appliances and heating systems as well as residential and commercial renovations;
- conduct projects to improve the uptake of energy efficient technologies and the adoption of more forms of renewable energy;
- provide training to build capacity in the trades sector in providing sales, installation, and support for energy efficient technologies and systems;
- design outreach and public education initiatives that inform the Yukon public about the health, safety, economic and environmental benefits of energy efficiency and renewable energy; and
- work with utilities and federal, territorial, First Nation, provincial and municipal government organizations to deliver energy programs to Yukon residents.

Haekel Hill wind turbine, Whitehorse

ENERGY BRANCH STAFF

The Energy branch staff experienced a significant transition this year. Bob Collins, a Senior Energy Planner and original member of the Energy Solutions Centre staff, retired from an energy career spanning four decades. Bob's thoughtful approach to the development of an energy policy, his focus on the big picture, and his ability to create mathematical models to support that vision will be missed.

This year, the Energy branch added two new staff members. Marianne Gregoire and Andre Gagne joined us as Senior Energy Advisors. Marianne has a technical background in environmental science and is working with the Energy Branch to improve our commercial building services and energy planning. Andre, a former academic with Yukon College, has joined us to lead the Energy branch as it becomes Yukon's licensed service organization for the EnerGuide rating system.

We are (left to right):
Doug MacLean, *Technical Consultant*
Marianne Gregoire, *Senior Energy Advisor*
Ryan Hennessey, *Senior Energy Planner*
Cathy Cottrell, *Senior Energy Planner*
Shane Andre, *Director*
Jessica Garstin, *Office Coordinator*
James Wigmore, *Senior Energy Advisor*
Sean MacKinnon, *Senior Energy Advisor*
Andre Gagne, *Senior Energy Advisor*

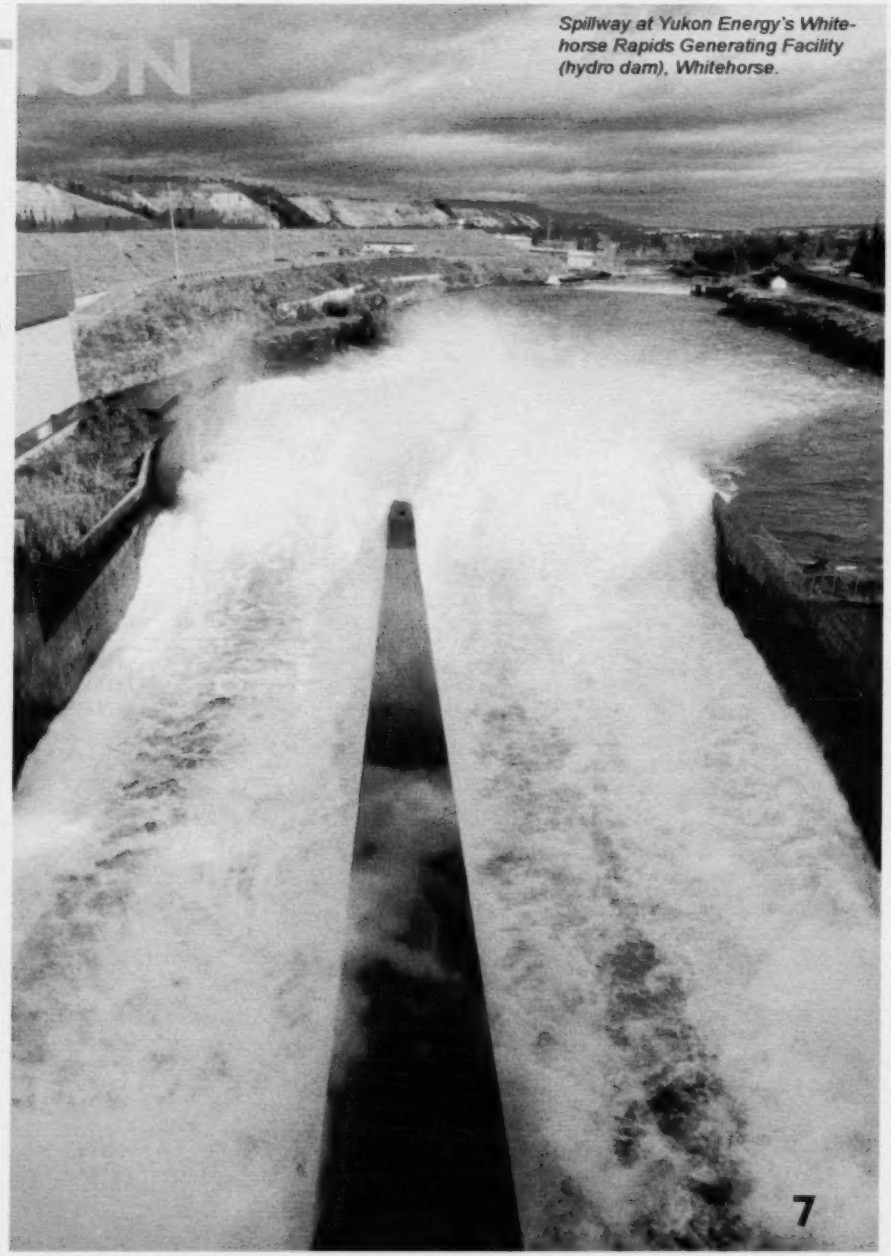
STRATEGIC DIRECTION

For the fiscal year 2015-2016, the Energy branch worked to realize the following key objectives:

1. Implement new programing focused on improving the efficiency of Yukon buildings;
2. Continue to implement the *Energy Strategy for Yukon* including the development and implementation of biomass energy and independent power production policies; and
3. Establish the Energy branch as the authority of choice for providing technical information related to energy in the territory.

These objectives are critical for achieving our mandate. Each area of activity is intended to foster a transformation of the Yukon's energy market by improving Yukon's access to technical information and technologies.

Through these objectives, we ensure that residents and decision-makers alike can make the most informed choices possible in balancing the trade-offs that exist between the benefits of new economic opportunities and the environmental impacts of those opportunities.

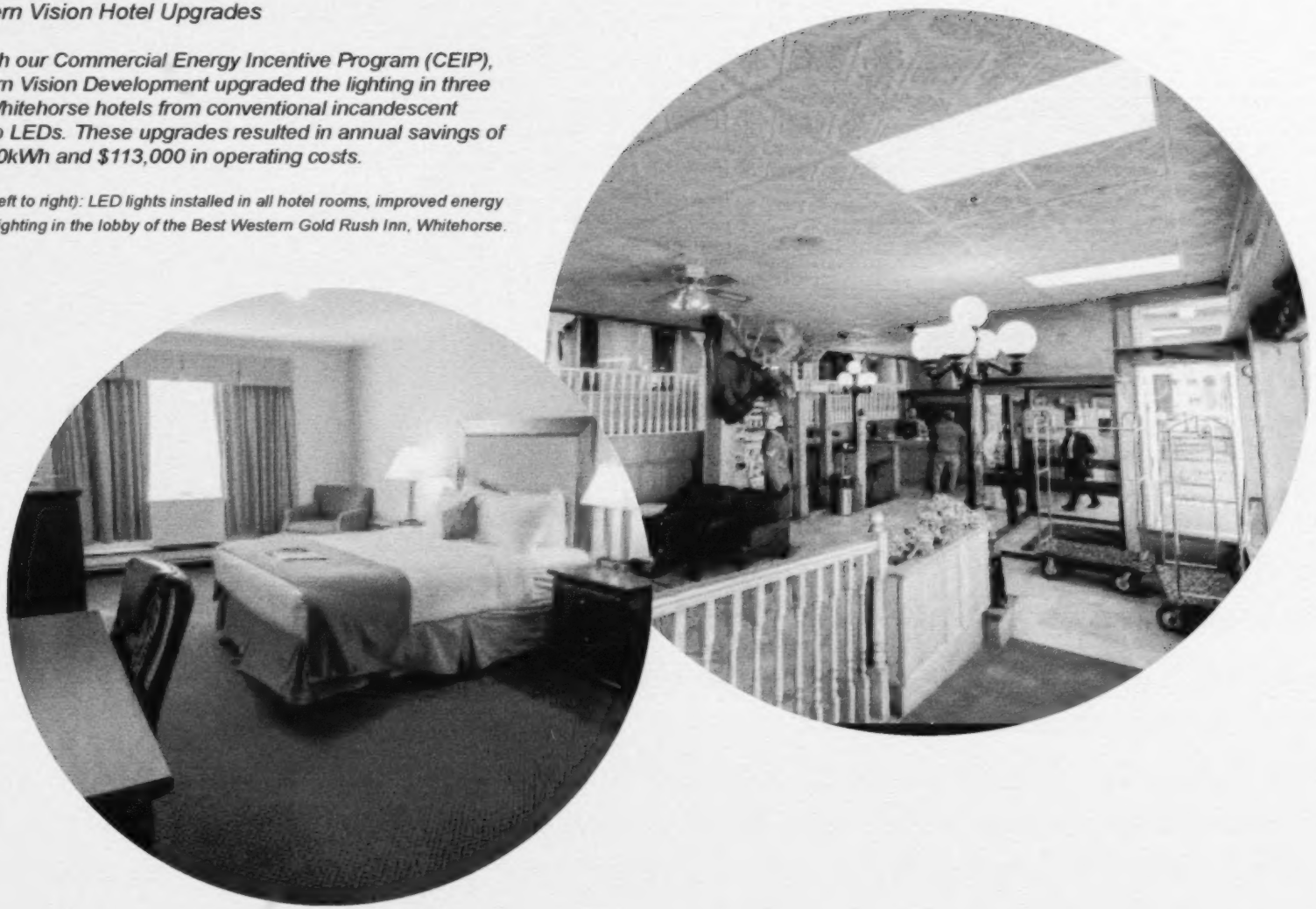


Spillway at Yukon Energy's Whitehorse Rapids Generating Facility (hydro dam), Whitehorse.

Energy Project Snapshot:
Northern Vision Hotel Upgrades

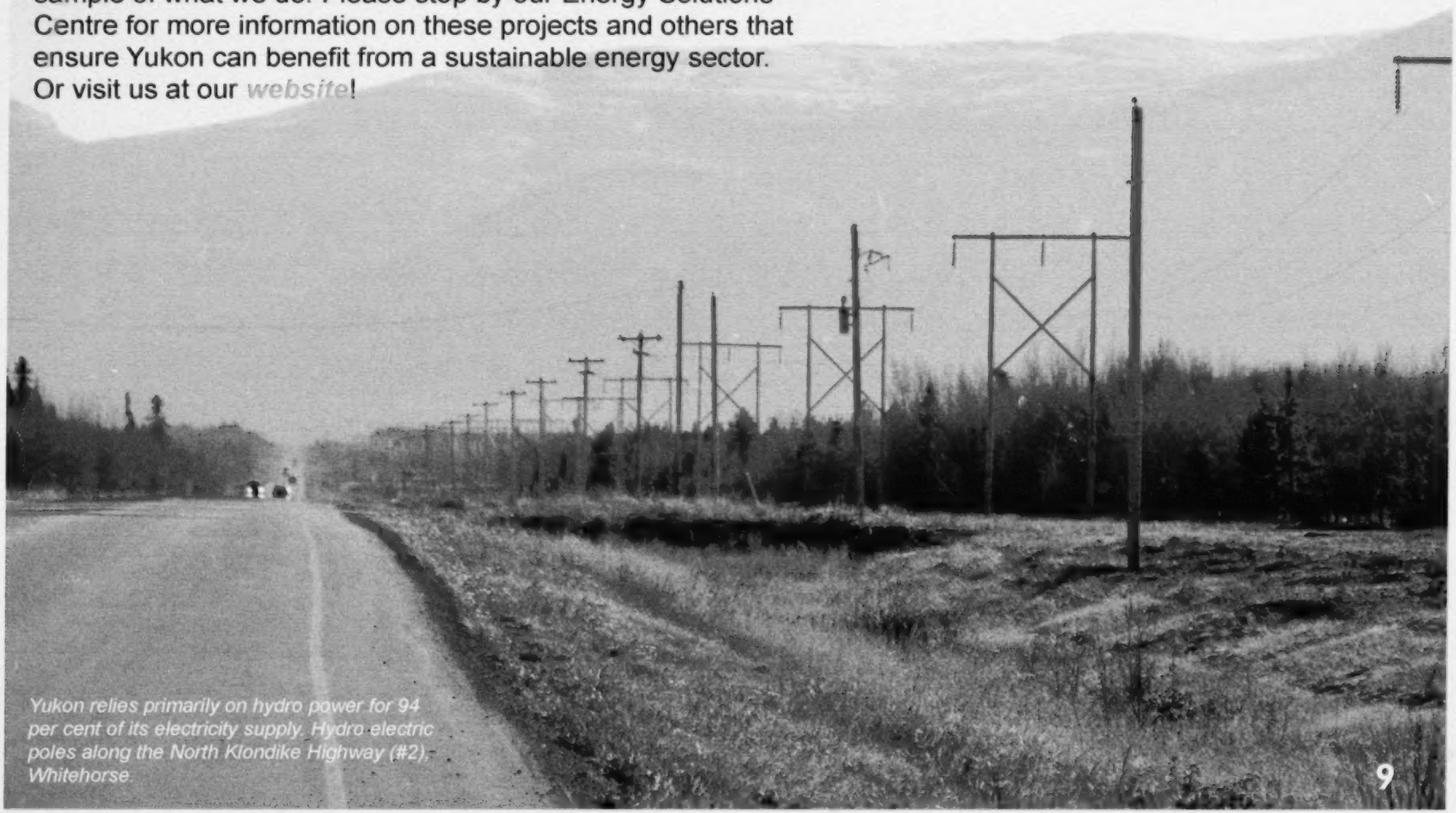
Through our Commercial Energy Incentive Program (CEIP), Northern Vision Development upgraded the lighting in three of its Whitehorse hotels from conventional incandescent lights to LEDs. These upgrades resulted in annual savings of 942,000kWh and $113,000 in operating costs.

Photos (left to right): LED lights installed in all hotel rooms, improved energy efficient lighting in the lobby of the Best Western Gold Rush Inn, Whitehorse.



PROGRESS REPORT

Over the past year the Energy branch has worked hard to meet the energy needs of Yukon. The following selection of projects is provided to highlight our successes. This is only a sample of what we do. Please stop by our Energy Solutions Centre for more information on these projects and others that ensure Yukon can benefit from a sustainable energy sector. Or visit us at our website!



Yukon relies primarily on hydro power for 94 per cent of its electricity supply. Hydro-electric poles along the North Klondike Highway (#2) - Whitehorse.

OBJECTIVE 1:
Improve the Energy Efficiency of Yukon buildings

Our work to improve the energy efficiency of Yukon occurs primarily through the *Good Energy Incentives Program*. Now entering its tenth year, the Good Energy program has become the cornerstone of our market transformation activities, offering incentives on the purchase of energy efficient domestic and heating appliances, on the retirement of inefficient refrigerators, on conducting residential energy assessments and energy efficient renovations. Our Energy Solutions Centre storefront also plays a key role in delivering information and services related to the Good Energy program.

This year, we are proud to once again report that the program's popularity and use by Yukon residents and businesses alike continues to grow. Per capita, Yukoners now have more access to demand side management support than anywhere else in the country thanks to our flagship program. More than 28,043 rebates have been issued to Yukoners for energy efficient appliances since Good Energy began a decade ago. The energy saving for 2015 are estimated at 3,412,124 kWh, which is equal to $549,676 in energy costs saved for our clients. Through their energy efficient choices, our clients also conserved 433 tonnes of CO_2 last year which is about the same amount of carbon emitted by 72 cars for one year!

A super-insulated new home rated at EnerGuide 85 or more. Whitehorse

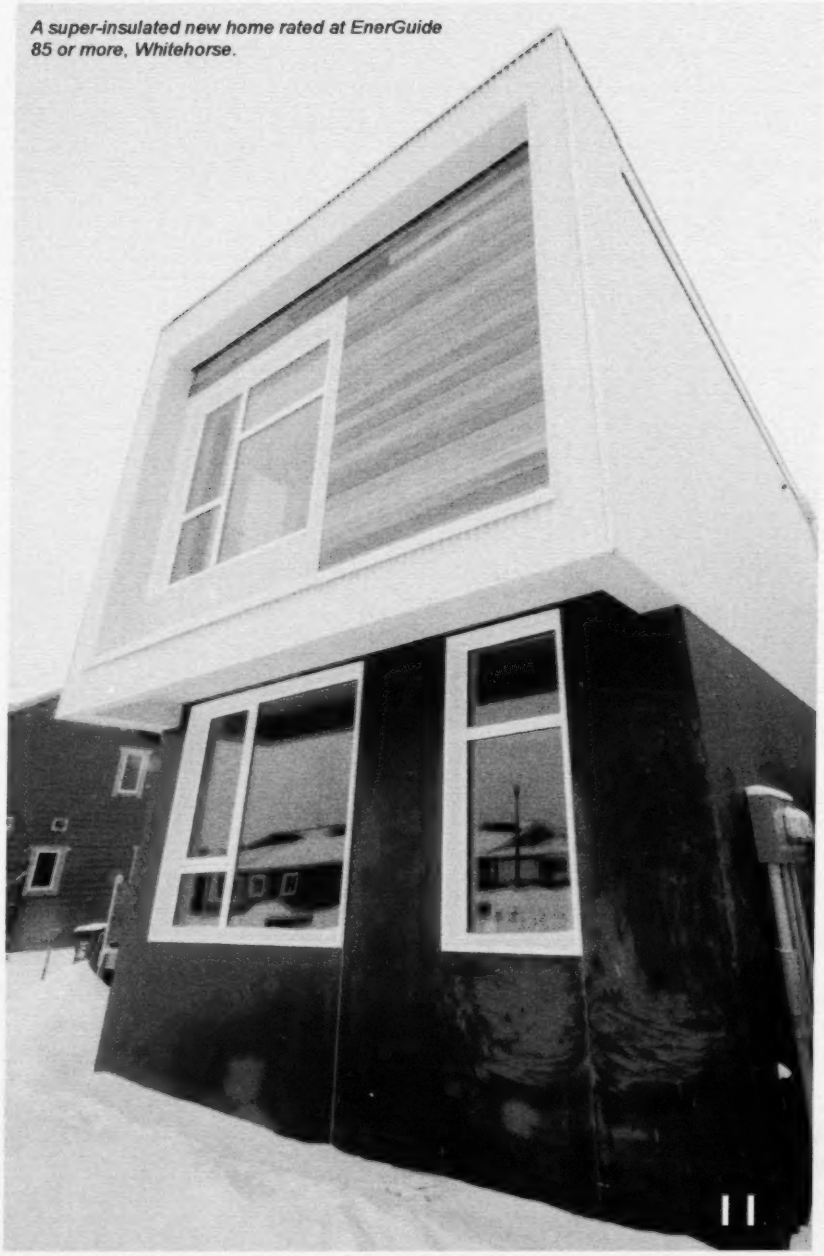
Two new programs were recently added to the Good Energy incentives suite. The Residential Energy Incentive Program and the Commercial Energy Incentive Program assist us in achieving our first objective for the fiscal year.

RESIDENTIAL ENERGY INCENTIVE PROGRAM

The Residential Energy Incentive Program was launched in January 2015. This program provides incentives to home owners who improve the energy efficiency of their existing home through insulation and air sealing renovations. New home builders meeting the EnerGuide 85 rating or greater also qualify for this incentive. Response was immediate and greater than expected. Over the course of the program, we have provided 650 rebates to the public amounting to $1,452,806, and saving 539,666 kWh per year. This program is a two year pilot, ending March 31, 2017.

COMMERCIAL ENERGY INCENTIVE PROGRAM

Launched in April 2015, the Commercial Energy Incentive Program promotes energy efficiency renovation upgrades to institutional and commercial buildings along with multi-family dwellings. The program also offers an LED lighting system retrofit incentive for commercial buildings. Over the past year, 22 commercial energy program incentives were issued. The incentives were mainly for the LED lighting system retrofit. This amounted to $55,690 in incentives and saved 1,413,627 kWh, demonstrating the significant saving potential that exists in our commercial sector! This program is a two year pilot, ending March 31, 2017.



A super-insulated new home rated at EnerGuide 85 or more, Whitehorse.

OBJECTIVE 2: Implement the Energy Strategy for Yukon

Since 2009 when the Energy Strategy for Yukon was adopted, the Energy branch has been working to ensure we achieve the strategy's commitments. This year we focused on completing the Independent Power Production Policy and the Biomass Energy Strategy.

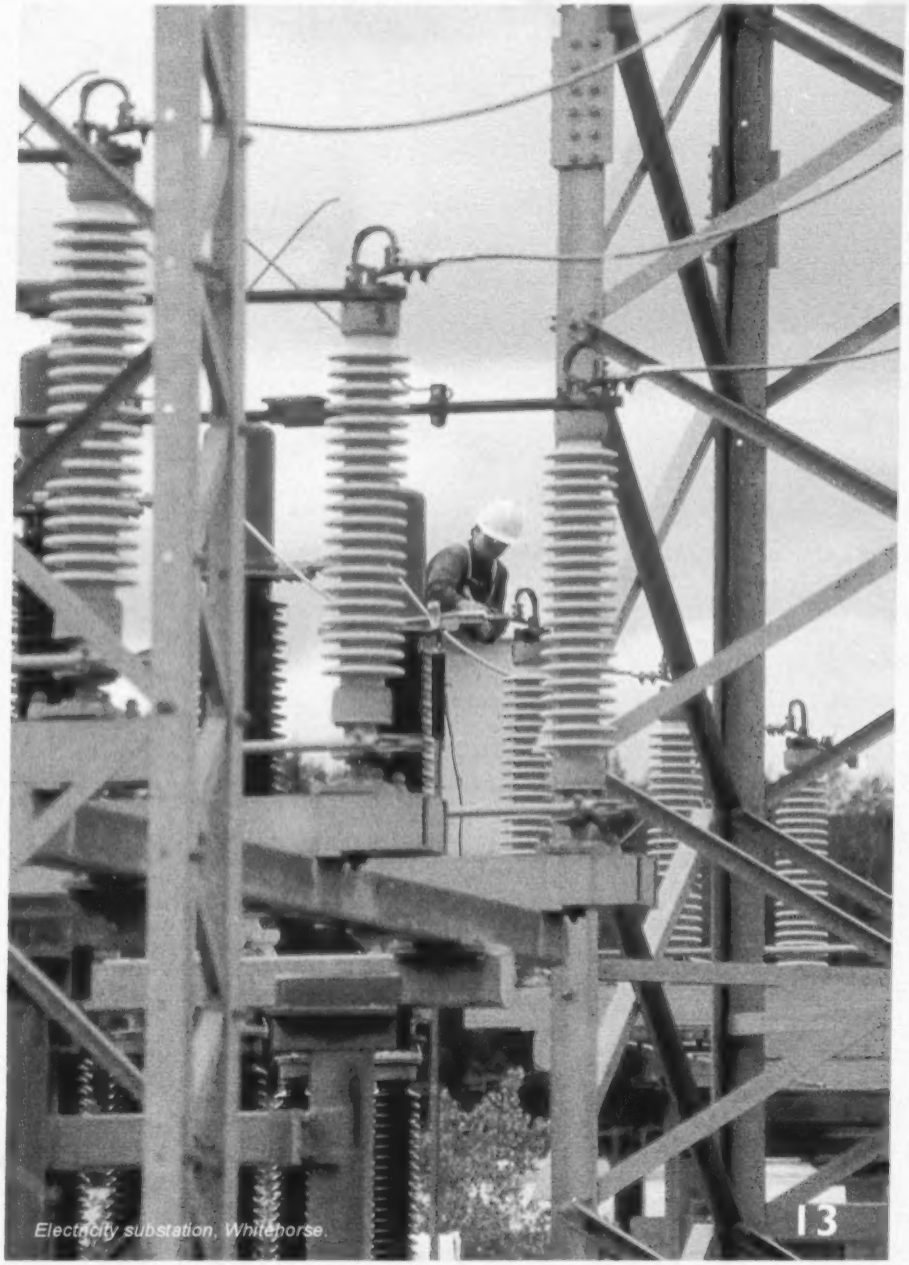
Agriculture Solar Project at the Gunnar Nilsson and Mickey Lammers Research Forest, Whitehorse.

INDEPENDENT POWER PRODUCTION POLICY

The *Independent Power Production (IPP) policy* was adopted by Yukon government in October 2015. The policy allows private producers to generate electricity from clean energy sources, connect to the grid, and sell power to local utilities. This means that private companies, Yukon First Nations and other non-utility organisations are able to generate electricity in the Yukon.

The IPP policy provides a number of benefits to Yukoners including diversifying our energy portfolio, diversifying our economy, and creating jobs in the communities. The policy also works to ensure that the addition of these new energy projects neither raises our electricity rates and nor requires substantial changes to our infrastructure.

This year, the Energy branch worked extensively with ATCO Electric Yukon, the Yukon Energy Corporation and the Yukon Development Corporation to develop the regulations, standards and purchase rates required to make the IPP policy successful.

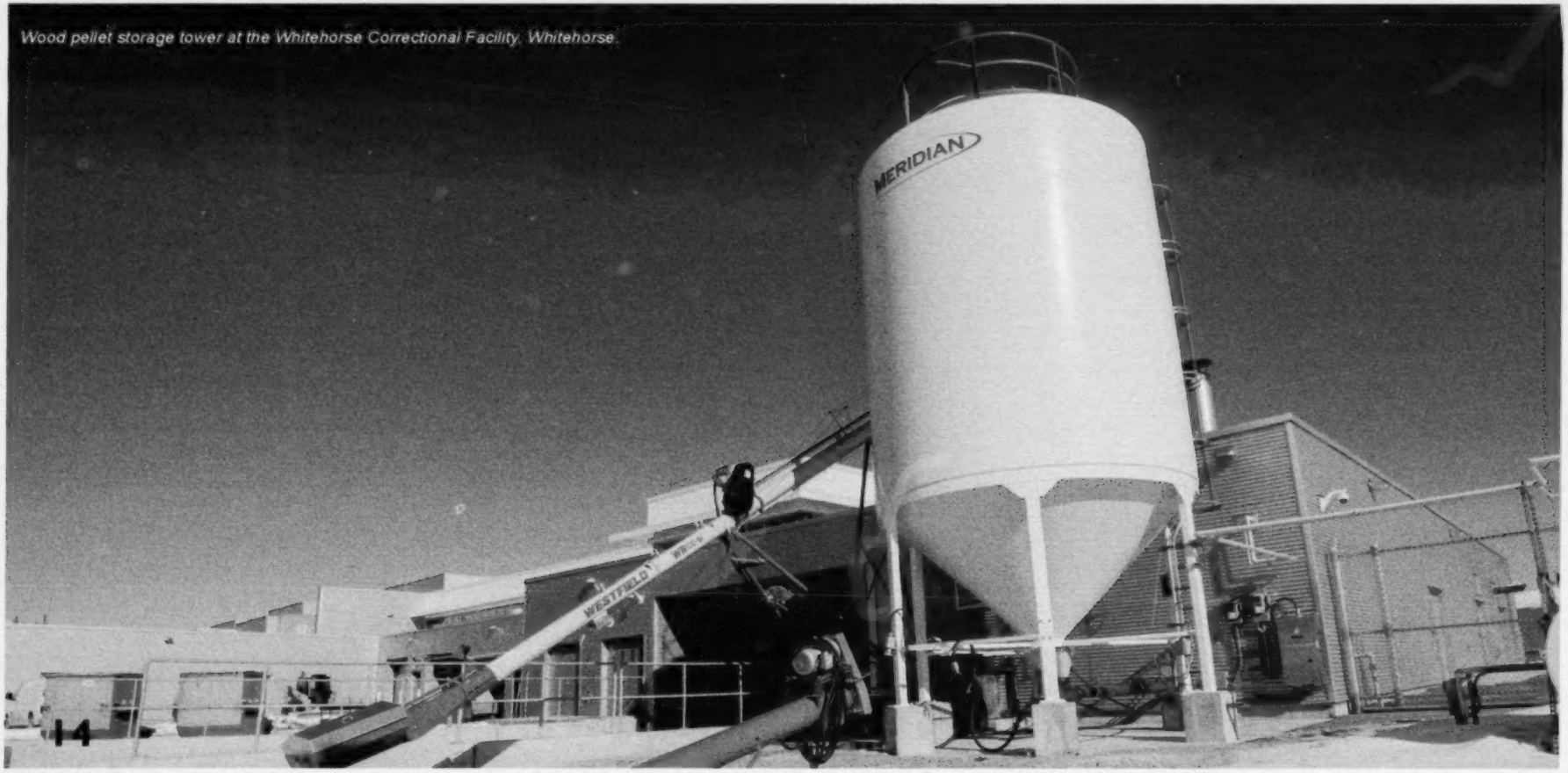


Electricity substation, Whitehorse.

BIOMASS ENERGY STRATEGY

The Yukon government adopted the *Biomass Energy Strategy* in February 2016. In Yukon, biomass energy generally refers to the burning of wood products to generate either heat or electricity. The strategy provides opportunities to increase the use of this renewable energy and fosters our efforts to achieve energy self-reliance.

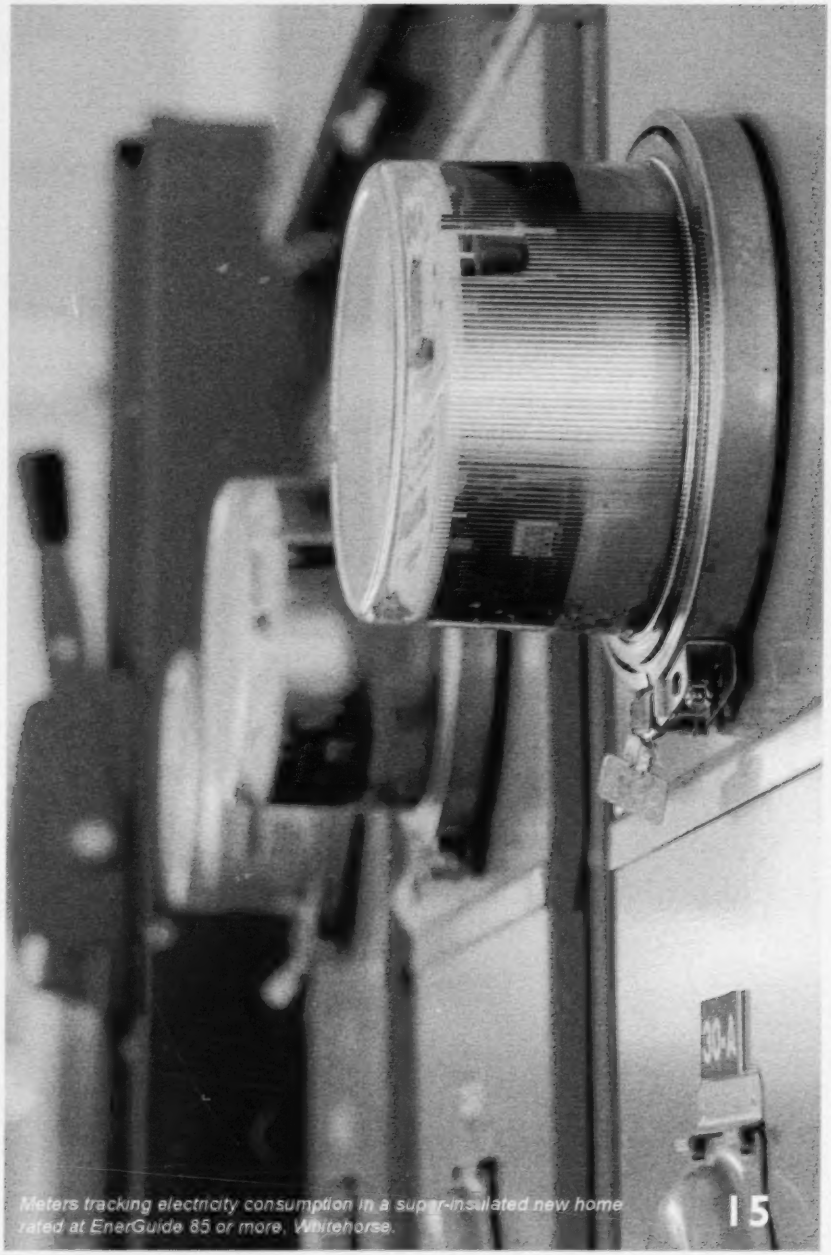
The proposed use of biomass for generating energy has many interrelated issues including the environmental impacts of burning wood products, the effective issuance of permits, managing forest regrowth and fuel quality, and supporting our heating sector professionals as they work to meet the demand for biomass products.



Wood pellet storage tower at the Whitehorse Correctional Facility, Whitehorse.

OBJECTIVE 3: Establish the Energy branch as the Energy Information Hub for Yukon

It is our commitment to ensure Yukoners can keep up to date on the rapidly changing and complex portfolio of energy options in Yukon. Whether it is working with communities to plan their energy future, investigating the viability of rapidly changing energy technologies in Yukon's climate, or just helping clients in purchasing their next heating system, the Energy branch's staff works hard to ensure that information and resources are available and up to date.



Meters tracking electricity consumption in a super-insulated new home rated at EnerGuide 85 or more, Whitehorse.

Participants in our solar photovoltaic course learning how to design and install solar electricity systems, Whitehorse.

SOLAR PHOTOVOLTAIC INSTALLATION COURSES FOR BUILDERS

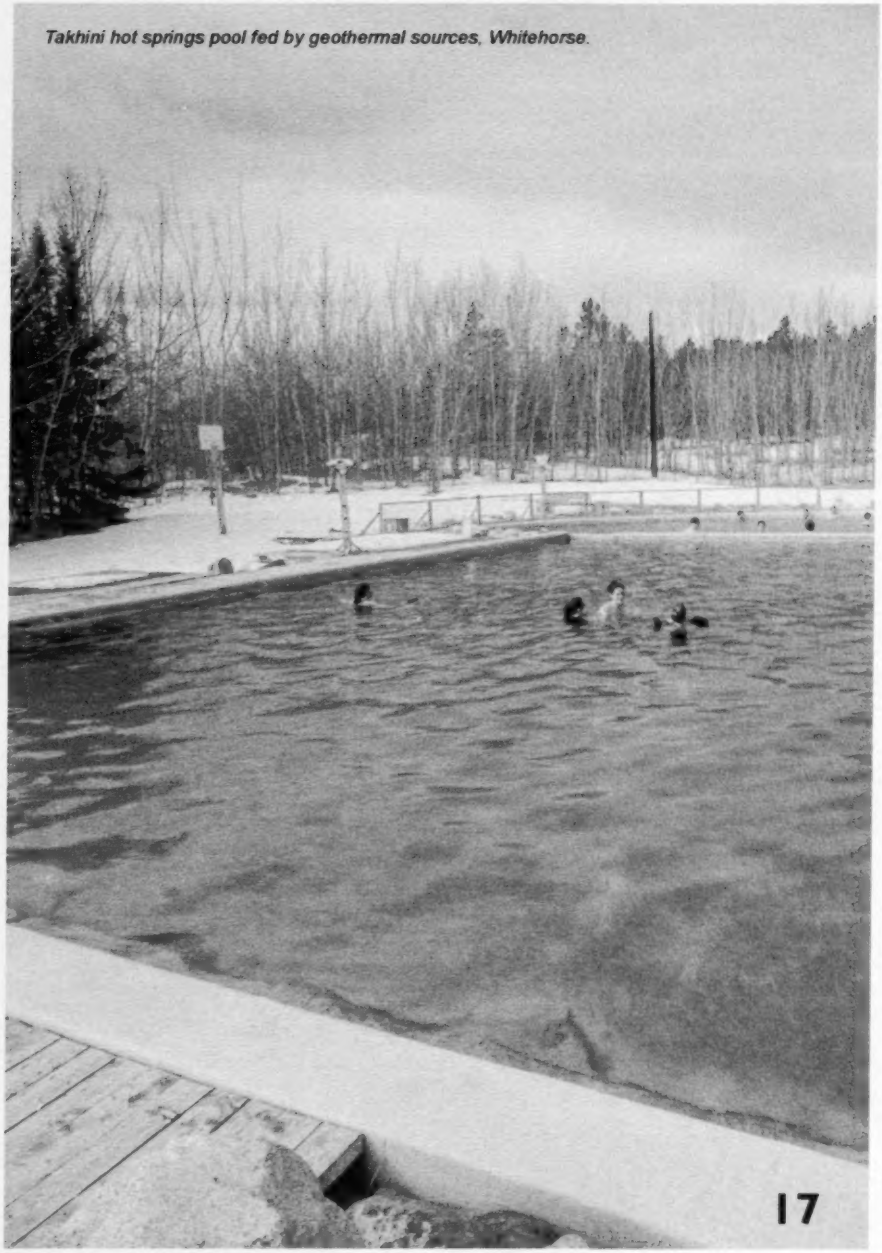
The Energy branch offered a five day solar photovoltaic (PV) installation course to 14 Yukon builders last year. The course provided the theoretical and technical knowledge necessary to design and install off-grid and grid-tie solar PV systems. The course included hands-on assembly and wiring of a small, fully functioning demonstration PV system. The system is currently outside our Energy Solutions Centre storefront. This was the third time the Energy branch has offered this course to the public and interest continues to be high. This demonstrates Yukoners' commitment to renewables and the continuing improvement in the economics of residential PV systems. The installation of residential PV arrays is supported by Yukon government through the *Micro-generation Program*, which provides a fixed cost of $0.21/kWh for surplus power not consumed by residential energy use. This fixed cost helps to reduce the payback period for PV systems and is encouraging Yukoners to install renewable energy systems in their homes.

To date, 26 applications have been accepted into the program with 120 kW of systems installed and connected to the grid since the program's implementation in February 2014.

GEOTHERMAL ENERGY POTENTIAL MAPPING PROJECT

We worked with the Canadian Geothermal Energy Association (CanGEA) to produce a report and maps estimating Yukon's geothermal resources. *CanGEA's report and maps* published in March 2016 provide the geological, geophysical and environmental information necessary for identifying and evaluating Yukon's geothermal potential. According to the report, Yukon's cumulative geothermal potential could amount to about 1,700 MW of energy, which is equivalent to 18 times the current energy supplied by Yukon's renewable electrical system (90 MW).

The project was funded by the Canadian Northern Economic Development Agency, the Government of Yukon and the Canadian Geothermal Energy Association with contributions from the Yukon Energy Corporation and the Takhini Hot Pools. We plan to use this information as the foundation for the development of a Geothermal Energy Policy.



Takhini hot springs pool fed by geothermal sources, Whitehorse.

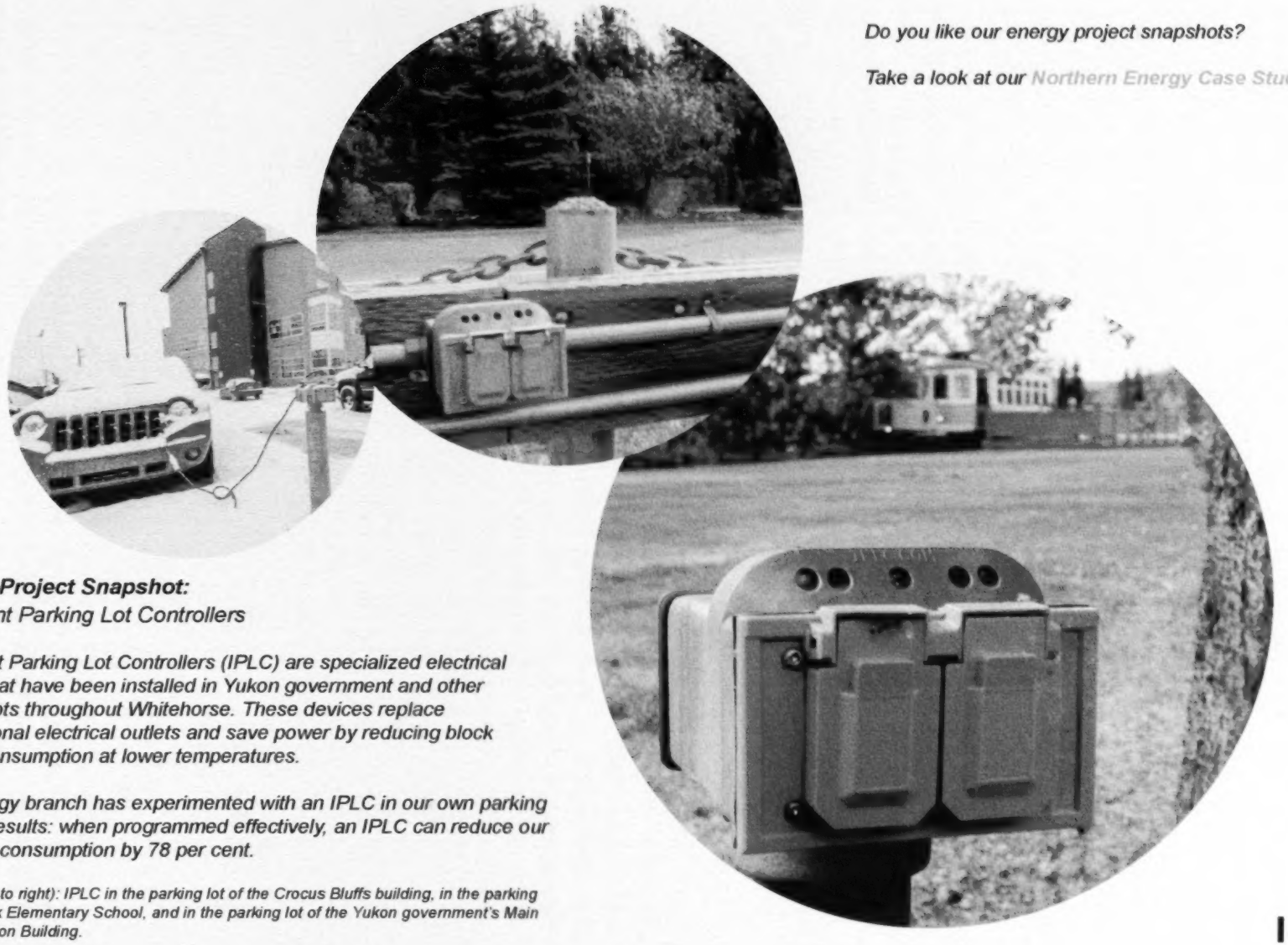
TRACKING AND SHARING INFORMATION

As a frontline service provider on energy data and policy in Yukon, it is important that we share information with our partners, both internal to Yukon government and external. We currently do this through the Public Building Energy Tracker (PBET) and the Interdepartmental Energy Project Tracker (IPET). We use PBET to track how much energy, both heat and electricity, we are using in Yukon government buildings. This data is critical for making responsible energy choices and reducing greenhouse gas emissions. We also collect information on energy related projects done by other departments, such as community energy projects and economic feasibility assessments, to ensure we avoid the duplication of effort. We also try to collect the findings for these projects to present a clear picture of how energy is being developed and used in the territory. As the secretariat and a regular participant in the Yukon Energy Partners meetings, we can communicate our projects to our municipal, not-for-profit, and utility partners in a meaningful way.

Energy Branch staff sharing technical information on solar photovoltaic systems with clients, Whitehorse

Do you like our energy project snapshots?

Take a look at our Northern Energy Case Studies!



Energy Project Snapshot:
Intelligent Parking Lot Controllers

Intelligent Parking Lot Controllers (IPLC) are specialized electrical outlets that have been installed in Yukon government and other parking lots throughout Whitehorse. These devices replace conventional electrical outlets and save power by reducing block heater consumption at lower temperatures.

The Energy branch has experimented with an IPLC in our own parking lot. The results: when programmed effectively, an IPLC can reduce our electrical consumption by 78 per cent.

Photos (left to right): IPLC in the parking lot of the Crocus Bluffs building, in the parking lot of Selkirk Elementary School, and in the parking lot of the Yukon government's Main Administration Building.

The 2016-2017 year is a busy one, and we are currently working to interpret how the new federal government's commitments to green economic development, renewable energy, and climate change will create opportunities for Yukon. We look forward to ensuring Yukoners can benefit from them through our efforts to promote a secure and sustainable Yukon energy sector. Our objectives for 2016-2017 therefore remain similar to our past objectives:

1. Continue the implementation of the Energy Strategy for Yukon including the implementation of Biomass Energy Strategy and the Independent Power Production policy and the development of a Geothermal policy.
2. Continue to deliver, market, and report on our suite of energy efficiency incentive programs.
3. Work to establish the Energy branch as the authority and provider of choice for technical information related to energy in the territory.

Despite the similarities, we expect to report on many new and exciting activities over the coming 2016-2017 year.

Energy branch staff doing maintenance and monitoring of Yukon's air quality monitoring and testing system, Whitehorse.

In the meantime...

...we will continue to provide new energy services and educational resources to bolster energy efficiency and foster the use of renewable energy in the territory. Yukon's energy sector is growing and we're growing with it.

We encourage you to visit our website at www.energy.gov.yk.ca or call us at 867-393-7063 or 1-800-661-0408 x7063 to get information about energy related matters of interest to you.